

IN THE CLAIMS:

Please amend claims as follows.

1. ((previously presented) A tuneable phase shifter and/or attenuator comprising a waveguide having a channel defined by internal walls of the waveguide and a piece of photo-responsive material (18) disposed within the waveguide and having an outside surface directly along one of the internal walls of said channel, a light source disposed outside the waveguide to emit light through an aperture (30) of said internal wall to impinge on at least part of the outside surface of said piece of photo-responsive material (18).

2. (currently amended) The tuneable phase shifter and/or attenuator as in claim 1, wherein the photo-responsive material (18) is a photo-conductive material [[,]].

3. (previously presented) The tuneable phase shifter and/or attenuator as in claim 1 wherein at least the surface of the piece of photo-responsive material facing the aperture is pacified by oxidation.

4. (original) The tuneable phase shifter and/or attenuator as in claim 3, wherein at least the surface of the piece of photo-responsive material facing the aperture has a coating of an epoxy resin.

5. (previously presented) The tuneable phase shifter and/or attenuator as in claim 1, wherein at least part of the surface of the piece of photo-responsive material facing the aperture is covered with strips of reflective elements to avoid radiation inside the wavelength to be lost outside.

6. (original) The tuneable phase shifter and/or attenuator as in claim 5, wherein said strips form a grid.

7. (previously presented) A tuneable phase shifter and/or attenuator comprising a waveguide having a channel defined by internal walls of the waveguide and a piece of photo-responsive material disposed within the waveguide and a light source to emit light to

impinge on at least part of a surface of said piece of photo-responsive material, characterized in that the photo-responsive material is spaced from an internal wall of said channel and in that the light source is adjustable to generate in the piece of photo-responsive material a carrier concentration between 10^{12} cm^{-3} and 10^{16} cm^{-3} , to modify the real and imaginary part of the dielectric constant of the photo-responsive material whereby at least one mode is generated that has part of a field of said mode inside the piece of photo-responsive material and another part of the field in the waveguide whereby a phase shifter and/or attenuator that is dependant on the light illumination is generated over a frequency range.

8. (original) A tuneable phase shifter and/or attenuator as in claim 7, wherein said carrier concentration is between 10^{14} cm^{-3} and 10^{16} cm^{-3} .

9. (previously presented) A tuneable phase shifter and/or attenuator as in claim 7, wherein said mode is of a first type that has a field intensity inside the photo-responsive material layer that is small relative to the field in the channel outside the photo-responsive material.

10. (currently amended) A tuneable phase shifter and/or attenuator as in claim 9, wherein said mode of [[a]] the first type is TE_{20} .

11. (currently amended) A tuneable phase shifter and/or attenuator as in claim 7, wherein said mode is of a second type that has a field intensity inside the photo-responsive material that is high relative to the field in the channel outside the photo-responsive material.

12. (previously presented) A tuneable phase shifter and/or attenuator as in claim 11 wherein said mode of the second type is TE_{10} or TE_{11} .

13. (previously presented) A tuneable phase shifter and/or attenuator as in claim 12, wherein the intensity of the light source is adjustable to place at least one of said modes of the second type in a cut-off state.

14. (previously presented) A tuneable phase shifter and/or attenuator as in claim 1, wherein the illumination of the piece of photo-responsive material is carried out at an angle such that total internal reflection occurs.

15. (previously presented) The tuneable phase shifter and/or attenuator of claim 2, wherein photo-conductive material is one of Si, GaAs or Ge.

16. (previously presented) The tuneable phase shifter and/or attenuator of claim of claim 1, wherein the light source is adjustable to generate in said piece of photo-responsive material (18) a carrier concentration between 10^{18} cm^{-3} and 10^{21} cm^{-3} .